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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/711,160	08/28/2004	Yung-Feng Cheng	13794-US-PA	5159

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JIANQ CHYUN INTELLECTUAL PROPERTY OFFICE  
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ROOSEVELT ROAD, SECTION 2  
TAIPEI, 100  
TAIWAN

EXAMINER

RUGGLES, JOHN S

ART UNIT	PAPER NUMBER
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1795

NOTIFICATION DATE	DELIVERY MODE
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01/11/2008

ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

USA@JCIPGROUP.COM.TW

<b>Office Action Summary</b>	<b>Application No.</b>		<b>Applicant(s)</b>	
	10/711,160		CHENG, YUNG-FENG	
	<b>Examiner</b>		<b>Art Unit</b>	
	John Ruggles		1795	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 28 August 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 August 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### *Specification*

The disclosure is objected to because of the following informalities: (1) at paragraph [0016] line 5 (as indicated in the corresponding instant US PGPub 2006/0046157 published 3/2/06 that is listed on the accompanying PTO-892), "is recess more than" should be corrected to --is ~~recess~~ recessed more than-- and (2) at [0020] line 9 (of the PGPub), "other type of" should be changed to --other [[type]] types of--.

Appropriate correction is required.

### *Claim Rejections - 35 USC § 112*

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 5 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter, which Applicant regards as the invention.

In claim 5, it is unclear about whether the language "comprise recessed portions of the substrate" refers to (A) only the transparent end portion (having 180° PS) of the isolated linear pattern, (B) only the transparent PS region (having 90° PS) adjacent to the ends of the dense linear patterns, or (C) both (A) and (B). However, for the purpose of this Office action, this language is interpreted to read as follows: --each comprise a recessed ~~portions~~ portion of the substrate--, in accordance with (C) above.

***Claim Rejections - 35 USC § 102 or 103***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. 103(a), which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 8-10 and 12 are rejected under 35 U.S.C. 102(b) as being anticipated by Okamoto (US 5,358,807).

Okamoto teaches a mask and a method of manufacturing the mask (title). The mask is exemplified by a phase shift mask (PSM, abstract) having a 180-degree PS recessed groove 7a (transparent end portion with a 180° PS) of depth "d" in substrate 2 between a transparent portion (unetched substrate) in region B and the edge of pattern A(3) including an end of a linear (e.g., isolated, etc.) portion made from a metal layer 3, as illustrated by Figures 6 and 7 (c9/L39 to c10/L15). The substrate 2 is transparent quartz glass and the metal layer 3 is chromium (Cr) or Cr oxide on Cr for the light shielding (opaque) region A (c6/L27-42, *instant claims 8-10 and 12*).

Claims 8-9 are rejected under 35 U.S.C. 102(b) as being anticipated by Lin (US 6,010,807).

Lin teaches a phase shifting mask (PSM, for use in a photolithography process to fabricate semiconductors, title) that increases resolution and contrast of the resulting pattern

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definition (abstract). The PSM is exemplified by a top view in Figure 2A and a corresponding side view in Figure 2B. This PSM has a transparent quartz plate (substrate) 20 and a masking pattern that includes an isolated linear pattern extension portion 28 as well as a dense array of linear patterns 28. Each linear pattern 28 has a semitransparent PS edge or end portion 24 (with a transmittance of 4% to 8% and a 180° PS) on the end or the edge of a semitransparent masking layer 22 (with a transmittance of 4% to 8% and a non-PS of 0°). This PSM can be used for defining word or bit lines (of a memory device) or metal interconnects of IC elements or chips. Figure 2C shows the resulting light intensity from this PSM (c3/L17 to c4/L16, reading on *instant claims 8-9*).

Claims 14-16 are rejected under 35 U.S.C. 102(b) as being anticipated by Hsu (US 2003/0077519).

Hsu teaches an alternative phase shifting mask (PSM) that cancels phase conflict (title, [0002]). As illustrated in Figure 7 and front page Figure 8, this PSM has a transparent substrate 40 with light shielding (opaque, e.g., chrome (Cr), etc.) linear layer (dense) regions 45 (*instant claim 16*), each end of which has an adjacent 90° PS (within the range of 85° to 95° PS) translucent layer 49 (reading on the transparent 90° PS region of *instant claim 14*) at the common border between a first transparent region 46 (0° non-PS) and a second transparent region 48 (180° PS, which is formed by a concave recess 51 in the substrate as shown in Figure 7, [0025], [0026]). The transparent substrate 40 material is exemplified as being quartz, which is also the same material for the transparent substrate 10 in prior art Figure 1 ([0022] lines 4-7, *instant claim 15*) and the wholly transparent region 24 (0° non-PS) of the substrate 20 in the halftone PSM (att-PSM) depicted in prior art Figure 2a [0007]. In this att-PSM of Figure 2a, the

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attenuated transparent regions 22 (MoSiON with a transparency of only 4% to 10% (clearly semi-transparent), 180° PS) are used as the (dense) linear patterns to make the contrast clearer between the wholly transparent region 24 (0° non-PS) and the attenuated transparent region 22 (180° PS), so that resolution of the exposure process can be improved (as indicated in Figure 2c, [0007]).

Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hsu (US 2003/0077519).

Hsu (as discussed above) does not specifically teach that the Figure 8 PSM dense linear patterns 45 each include a layer of semi-transparent material with a PS of 180°.

However, it would still have been obvious to one of ordinary skill in the art at the time of the invention to use a layer of semi-transparent material with a PS of 180° for the Figure 8 PSM dense linear patterns 45 taught by Hsu, because doing so would be reasonably expected to succeed in clearer contrast and improved exposure resolution (as taught by Hsu [0007], which is described above, *instant claim 17*).

Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hsu (US 2003/0077519) in view of Chapple-Sokol et al. (US 5,465,859).

Hsu (as discussed above) does not specifically teach that the Figure 8 PSM transparent 90° PS end adjacent region 49 includes a recessed portion of the transparent substrate 40.

Nevertheless, it has been known for some time that a transparent 90° PS region can be achieved on a PSM by etching a recess of an appropriate depth in the transparent substrate of the PSM (subtractive method) instead of adding an appropriate thickness of transparent PS material onto the substrate (additive method) to form the transparent 90° PS region, as exemplified by

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Chapple-Sokol et al. In this reference, a subtractive method is taught for making a PSM that includes etching transparent  $90^\circ$  PS regions in a transparent quartz substrate 25, with the known advantages for this subtractive method that include precise etch depth control, self-aligned phase error correction, and reduced sidewall scattering (c1/L42-44, c1/L57 to c2/L23, c4/L1). In Figure 2a, a PSM is shown that has  $90^\circ$  PS strips or regions 20 between  $0^\circ$  (non-PS) and  $180^\circ$  PS (indicated as  $\pi$  PS) transparent regions, in order to reduce undesirable dark "loop" or line formation at the transition between the  $0^\circ$  (non-PS) and  $180^\circ$  PS transparent regions (c3/L51-61). Figures 2f-2g show similar use of  $90^\circ$  PS regions 20 between  $0^\circ$  (non-PS) and  $90^\circ$  PS (indicated as  $\pi/2$  PS in Figure 2f) transparent regions (c4/L23-25). The recessed  $90^\circ$  ( $\pi/2$ ) PS regions are more clearly shown as 28, 29, 30, 31 in the side view of Figure 2e (c4/L19-22) and 38, 39, 40 in the side view of Figure 2i (c4/L32-35).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to make the Figure 8 PSM transparent  $90^\circ$  PS end adjacent region 49 (as taught by Hsu) by a subtractive etching method so that the  $90^\circ$  PS end adjacent region includes a recessed portion of the transparent substrate 40, because of the known advantages for such a subtractive method that include precise etch depth control, self-aligned phase error correction, and reduced sidewall scattering when etching the  $90^\circ$  PS recess in the transparent substrate of the PSM (as taught by Chapple-Sokol et al.).

Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over either Okamoto (US 5,358,807) or Lin (US 6,010,807) in view of Hsu (US 2003/0077519).

While Okamoto teaches a PSM having an opaque metal A(3) isolated end portion (isolated linear pattern) and Lin teaches a PSM having a masking layer 22 isolated end portion

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(isolated linear pattern, each as discussed above), neither of these references specifically teaches that the isolated linear pattern includes a layer of semi-transparent material with a PS of 180°.

The teachings of Hsu are discussed above.

Therefore, it would still have been obvious to one of ordinary skill in the art at the time of the invention to use a layer of semi-transparent material with a PS of 180° for the isolated linear pattern on the PSM (taught by Okamoto or Lin), because doing so would be reasonably expected to succeed in clearer contrast and improved exposure resolution from this modified PSM (as taught by Hsu [0007], which is described above, *instant claim 11*).

Claims 11 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over either Okamoto (US 5,358,807) or Lin (US 6,010,807) in view of Hsu (US 2003/0077519) and Yang (US 2005/0048377).

While Okamoto teaches a PSM having an opaque metal A(3) isolated end portion (isolated linear pattern) and Lin teaches a PSM having a masking layer 22 isolated end portion (isolated linear pattern, each as discussed above), neither of these references specifically teaches: *[1]* that the isolated linear pattern includes a layer of semi-transparent material with a PS of 180° (*instant claim 11*) or *[2]* that the PSM includes a pair of opposite isolated linear patterns with their transparent end portions facing each other (*instant claim 13*).

The teachings of Hsu are discussed above.

Yang teaches a multi-transmittance photomask (such as a multi-transmittance halftone phase shift mask, HTPSM) along with materials and methods for fabricating it to improve lithography performance (title, abstract). This HTPSM includes patterns having regions of different transmittance for the purpose of reducing one or more of line edge shortening (line end



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shortening, LES), iso-to-dense bias, and edge-to-dense bias. Regions of denser or longer lines can be constructed to have a lower transmittance than regions of isolated lines (abstract). Figures 1-3 illustrate masks having patterns with different densities or lengths on the same transparent quartz substrate [0028], [0029], [0031]-[0034]. The semi-transparent halftone material provides a PS of 180° [0034], [0035]. In Figure 6, a comparison of Mask 1 on the right to that on the left shows that the iso-to-dense bias and the line end shortening (LES) of the isolated line 60 can be improved (by reducing the LES) when semi-transparent transmittance is increased from 6% (as shown in the isolated line 60 of the mask on the left in Figure 6) to 24% (as shown for the isolated line 65 on the right in Figure 6, [0037]). Figure 11 shows another example of reduced line end shortening (LES) by increasing semi-transparent transmittance from 6% to 24% for a pair of opposite isolated linear patterns 1 and 4 with their transparent end portions facing each other [0043].

Therefore, it would still have been obvious to one of ordinary skill in the art at the time of the invention to use a layer of semi-transparent material with a PS of 180° for the isolated linear pattern having a transparent end portion (180° PS) on the PSM (as taught by Okamoto or Lin), because doing so would be reasonably expected to succeed in clearer contrast and improved exposure resolution from this modified PSM having a semi-transparent isolated linear pattern (as taught by Hsu [0007], which is described above, */I/*). In addition, it would have been obvious to increase the transmittance of opposite isolated linear patterns (including semi-transparent material with a PS of 180° on the PSM taught by Okamoto or Lin in combination with Hsu) that are positioned with their transparent end portions facing each other (as in the PSM shown by Figure 11 of Yang), because doing so would be reasonably expected to reduce line end

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shortening (LES) of the opposite isolated linear patterns positioned with their transparent end portions facing each other (as taught by Yang, *[2]*).

Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hsu (US 2003/0077519) in view of Yang (US 2005/0048377).

Hsu does not specifically teach two groups of dense linear patterns separated by a transparent 90° PS region adjacent to the ends of the dense linear patterns.

The teachings of Yang are discussed above.

It would have been obvious to one of ordinary skill in the art at the time of the invention to utilize the Figure 8 PSM having dense linear patterns 45 (e.g., of semi-transparent material for 180° PS, etc.) with transparent 90° PS regions 49 adjacent to the ends of the dense linear patterns 45 (as taught by Hsu) so that the dense linear patterns have adjusted transmittance when they are positioned with their transparent end portions facing each other (as in the PSM shown by Figure 11 of Yang), because doing so would be reasonably expected to reduce line end shortening (LES) of the opposite dense linear patterns positioned with their transparent end portions facing each other (as taught by Yang, *instant claim 19*).

Claims 1-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admitted Prior Art (AAPA, instant Figure 1) in view of either Okamoto (US 5,358,807) or Lin (US 6,010,807), and further in view of Hsu (US 2003/0077519), Yang (US 2005/0048377), and Chapple-Sokol et al. (US 5,465,859).

While showing the combination of oppositely positioned corresponding isolated and dense linear patterns of semi-transparent (halftone) 180° PS material (e.g., on a transparent

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substrate, etc.) of a halftone PSM (as shown by instant prior art Figure 1, [0006]), AAPA does not specifically teach other aspects of *instant claims 1-7* (as individually referenced below).

The teachings of Okamoto, Lin, Hsu, Yang, and Chapple-Sokol et al. are discussed above.

It would have been obvious to one of ordinary skill in the art at the time of the invention in the combination of oppositely positioned corresponding pair of isolated linear patterns (*instant claim 6*) and two groups of dense linear patterns (*instant claim 7*) made of semi-transparent (halftone) 180° PS material (e.g., on a transparent substrate, etc.) for a halftone PSM (as shown by AAPA) to use a transparent substrate of quartz or glass (as is notoriously well known in the art and exemplified above by at least Okamoto, Lin, Hsu, and Yang, *instant claim 2*) along with isolated and dense linear patterns that include either opaque layers (as taught by Okamoto or Hsu, *instant claim 3*) or semi-transparent layers with a PS of 180° (as taught by AAPA, Hsu, or Yang, *instant claim 4*) on the transparent substrate, wherein the isolated pattern has a transparent end portion with a PS of 180° (as taught by AAPA, Okamoto or Lin, and Yang), wherein the transparent PS region adjacent to the ends of the dense linear patterns has a PS of 90° (as taught by Hsu and Chapple-Sokol et al., *instant claim 1*), and wherein the transparent 180° PS end portion of the isolated pattern and the transparent 90° PS region (adjacent to the ends of the dense linear patterns) each comprise a recessed portion of the transparent substrate (as taught by Okamoto, Hsu, and Chapple-Sokol et al., *instant claim 5*), in order to achieve the known benefit(s) for each of these aspects (as exemplified by at least these references, which are each discussed in the rejections set forth above).

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### ***Double Patenting***

A rejection based on double patenting of the "same invention" type finds its support in the language of 35 U.S.C. 101 which states that "whoever invents or discovers any new and useful process ... may obtain a patent therefor ..." (Emphasis added). Thus, the term "same invention," in this context, means an invention drawn to identical subject matter. See *Miller v. Eagle Mfg. Co.*, 151 U.S. 186 (1894); *In re Ockert*, 245 F.2d 467, 114 USPQ 330 (CCPA 1957); and *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970).

A statutory type (35 U.S.C. 101) double patenting rejection can be overcome by canceling or amending the conflicting claims so they are no longer coextensive in scope. The filing of a terminal disclaimer cannot overcome a double patenting rejection based upon 35 U.S.C. 101.

Claims 8-9 are rejected under 35 U.S.C. 101 as claiming the same invention as that of claims 1 and 5 of prior U.S. Patent No. 6,010,807 (Lin, which has a common assignee (United Microelectronics Corp. of Taiwan) with the instant application). The patent claims are drawn to a PSM having a transparent quartz substrate (reading on *instant claim 9*) and a linear masking layer pattern that includes a peripheral or end portion of semi-transparent 180° PS material (reading on the isolated pattern including a transparent end portion with a 180° PS of *instant claim 8*). This is a double patenting rejection.

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting

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ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1-7 and 10-19 are rejected on the ground of nonstatutory obviousness-type double patenting (ODP) as being unpatentable over claims 1-7 of U.S. Patent No. 6,010,807 (Lin, which has a common assignee (United Microelectronics Corp. of Taiwan) with the instant application) in view of Okamoto (US 5,358,807), and further in view of Hsu (US 2003/0077519), Yang (US 2005/0048377), and Chapple-Sokol et al. (US 5,465,859). Although the conflicting claims are not identical, they are not patentably distinct from each other, because the aspects not specifically covered by the Lin patent claims (which are drawn to a PSM having a transparent quartz substrate and a linear masking layer pattern that includes a peripheral or end portion of semi-transparent 180° PS material) are taught by one or more of AAPA, Okamoto, Hsu, Yang, and/or Chapple-Sokol et al. (each of which is described above). The reasons for applying these references to the instant claims are set forth above.

Claims 1-19 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting (ODP) as being unpatentable over claims 1-8 of copending Application No. 11/161,084 (Shieh et al., corresponding to US 2007/0020532, which has a common assignee (United Microelectronics Corp. of Taiwan) with the instant application) in view of Applicant's Admitted Prior Art (AAPA, instant Figure 1), either Okamoto (US 5,358,807) or Lin (US 6,010,807), and further in view of Hsu (US 2003/0077519), Yang (US 2005/0048377), and Chapple-Sokol et al. (US 5,465,859). Although the conflicting claims are not identical, they are

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not patentably distinct from each other, because the aspects not specifically covered by the Shieh et al. copending application claims (which are drawn to a method for designing a PSM having a main strip pattern with a PS feature (at a PS of 60% to 100% and an optical transmission of 60% to 100%) at an end of the main strip on a substrate and wherein the main strip is either opaque or semi-transparent) are taught by one or more of AAPA, Okamoto or Lin, Hsu, Yang, and/or Chapple-Sokol et al. (each of which is described above). The reasons for applying these references to the instant claims are set forth above.

This is a provisional obviousness-type double patenting rejection.

### *Conclusion*

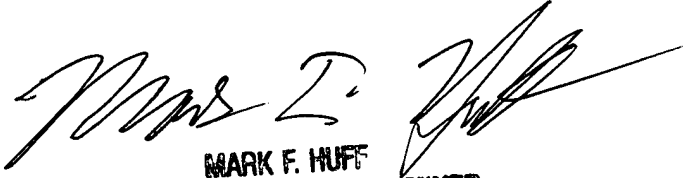
Any inquiry concerning this communication or earlier communications from the examiner should be directed to John Ruggles whose telephone number is 571-272-1390. The examiner can normally be reached on Monday-Thursday and alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Huff can be reached on 571-272-1385. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

jsr



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